

BEFORE THE
Federal Communications Commission
WASHINGTON, D.C. 20554

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In the Matter of

Amendment of Parts 2 and 15 of the
Commission's Rules to Permit Use of
Radio Frequencies Above 40 GHz for
New Radio Applications

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) ET Docket No. 94-124
) RM-8308
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To: The Commission

COMMENTS OF TRW INC.

TRW Inc. ("TRW"), by its attorneys and pursuant to Sections 1.415 and 1.419 of the Commission's Rules, hereby comments on the Commission's Notice of Proposed Rule Making in the above-captioned proceeding, Amendment of Parts 2 and 1 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications, FCC 94-273 (released November 8, 1994) ("NPRM"). For the reasons stated below, TRW specifically supports the Commission's proposal to allocate the 40.5-42.5 GHz band segment for a terrestrial fixed service that would be modeled after the Local Multipoint Distribution Service ("LMDS") that is currently proposed (with much controversy and uncertainty) for the 27.5-29.5 GHz band. See NPRM, FCC 94-273, slip op. at ¶¶ 23-25. Indeed, TRW urges the Commission to take the next logical step, and relocate the proposed LMDS from 27.5-29.5 GHz to the new 40.5-42.5 GHz band.

INTRODUCTION

TRW is an applicant for authority to establish a non-geostationary satellite system in the new Mobile Satellite Service Above 1 GHz ("MSS Above 1 GHz"). Service links for TRW's proposed system would be located in the 1.6 and 2.4 GHz bands, and TRW has requested 300 megahertz of spectrum in each direction, at 29.7-30.0 GHz and 19.8-20.1 GHz, for its feeder link operations.^{1/}

At the time TRW filed its initial application in 1991, there were only two applicants for commercial satellite systems in the internationally-allocated Ka-band satellite frequencies at 27.5-30.0 GHz and 17.7-20.2 GHz. One of those entities, MSS Above 1 GHz applicant Motorola Satellite Communications, Inc., had requested 100 MHz of spectrum in a different part of the band for its feeder link operations; the other entity, Norris Satellite Communications, Inc., had proposed a geostationary domestic fixed-satellite service ("FSS")/MSS system for the 29.5-30.0 GHz and 19.7-20.2 GHz bands.

In the last few years, there has been a rush on Ka-band frequencies. On the satellite side, the Commission has stated that it expects "to be able to identify sufficient spectrum within [the 27.5-30.0 GHz] band to satisfy the Earth-to-space feeder link requirements of all MSS Above 1 GHz applicants that may be licensed in

^{1/} See Application of TRW Inc., File Nos. 20-DSS-P-91(12), CSS-91-015, 17-SAT-LA-95, 18-SAT-AMEND-95.

[the CC Docket No. 92-166] proceeding."^{2/} In addition, two companies have filed applications for new FSS or hybrid FSS/MSS systems that would operate globally in substantial portions of the 27.5-30.0 GHz and 17.7-20.2 GHz bands.^{3/} Once these latter applications are placed on public notice and subject to a cut-off deadline pursuant to Section 25.155 of the Commission's rules, it is likely that at least two more FSS applications will be filed to round out that processing group.^{4/} At this point, it is uncertain how or even whether all identified potential users of the satellite allocations at 27.5-30.0 GHz and 17.7-20.2 GHz could be accommodated in the subject frequency bands.

The issue becomes infinitely more complicated by the fact that the Commission has proposed to assign 2000 megahertz of the spectrum in the uplink band at 27.5-30.0 GHz to a new terrestrial video delivery service -- the LMDS.^{5/}

^{2/} Amendment of the Commission's Rules to Establish Rules and Policies Pertaining to a Mobile Satellite Service in the 1610-1626.5/2483.5-2500 MHz Frequency Bands, 9 FCC Rcd 1094, 1131 (1994).

^{3/} See Applications of Hughes Communications Galaxy, Inc. (for the proposed geostationary "Spaceway" system) and Teledesic Corporation (for a nongeostationary FSS and MSS system).

^{4/} Both GE American Communications, Inc. and Martin Marietta Corporation were participants in the Commission's recent negotiated rulemaking regarding the Ka-band frequencies.

^{5/} See Rulemaking to Amend Part 1 and Part 21 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band and to Establish Rules and Policies for Local Multipoint Distribution Service, 8 FCC Rcd 557 (1993)

(continued...)

Early on, the Commission recognized that there were only marginal prospects for spectrum sharing between satellite and LMDS users.^{6/} This early recognition blossomed into reality last year, when a negotiated rulemaking committee chartered by the Commission to assist it in formulating the technical rules that would govern co-frequency sharing between satellite services and LMDS systems concluded eight weeks of intensive deliberations without reaching any consensus determination that co-frequency sharing would be feasible.^{7/} The Commission has yet to determine what course it will set to address the compatibility/feasibility concerns that now plague the 27.5-29.5 GHz segment of the international Ka-band FSS allocation (and of necessity also implicate the companion downlink band at 17.7-19.7 GHz).

In TRW's view, the Commission has, in the form of the instant proceeding, the ability to provide a satisfactory answer to the satellite/terrestrial sharing issue that hangs over the 27.5-29.5 GHz band. The fungibility of the LMDS

^{5/}(...continued)

(Notice of Proposed Rule Making, Tentative Decision, and Order on Reconsideration) ("LMDS NPRM"). See also Rulemaking to Amend Part 1 and Part 21 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band and to Establish Rules and Policies for Local Multipoint Distribution Service, 9 FCC Rcd 1394 (1994) ("Second LMDS NPRM").

^{6/} See LMDS NPRM, 8 FCC Rcd at 560 ("the multicell multipoint configurations in this proposal envision a wide area distribution of services which may foreclose the possibility of acceptable sharing conditions between satellite and terrestrial services").

^{7/} See Report of the LMDS/FSS 28 GHz Band Negotiated Rulemaking Committee, CC Docket No. 92-297 (September 23, 1994).

allocation and the proposed "Licensed Millimeter Wave Service" (or "LMWS") segment at 40.5-42.5 GHz is confirmed by the fact that the Commission is proposing to model its licensing rules for the LMWS bands on the rules it has proposed for the gridlocked LMDS service. The Commission's recognition of the suitability of the 40.5-42.5 GHz and for "LMDS-type" services is a dramatic development given the fact that only months before the NPRM was issued, the Commission had provisionally rejected consideration of the 40.5-42.5 GHz band for LMDS as unsupported by evidence of the band's utility for such a service.^{8/}

Surely, with the rapid acceptance of direct-to-home satellite broadcasting, and the advent of other alternatives to local cable television monopolies, it is not necessary for the Commission to undermine the viability of the LMDS service by establishing yet another video delivery medium in such close temporal proximity. If the Commission is committed to the timely emergence and ultimate viability of the LMDS and/or the LMWS, it should abandon its proposal to establish such a service in the Ka-bands, and concentrate its efforts exclusively on the 40.5-42.5 GHz (and possibly other band segments) that are at issue in this proceeding. This is the only logical approach.

^{8/} See Second LMDS NPRM, 9 FCC Rcd at 1397 n.15.

DISCUSSION

In its NPRM, the Commission stated its belief that "many of the uses of [LMWS] spectrum are likely to be technically and operationally similar to those contemplated in the 28 GHz band for the Local Multipoint Distribution Service (LMDS), e.g., fixed point-to-point and point-to-multipoint services for video, voice and data transmission to subscribers throughout an area." NPRM, FCC 94-273, slip op. at ¶ 23. As a result, the Commission proposed to model its licensing rules for the LMWS after the rules and procedures proposed for the LMDS. With specific respect to the 40.5-42.5 GHz band, the Commission proposed to divide the available spectrum into two license blocks of 1000 megahertz for exclusive assignment in each service area. Id.^{9/}

This recognition of the relative interchangeability of the proposed LMDS allocation at 27.5-29.5 GHz and the proposed LMWS allocation at 40.5-42.5 GHz -- indeed, the Commission views the latter allocation as having superior service prospects -- is in marked contrast to the state of affairs that existed with regard to the 40 GHz band just one year ago. In its Second LMDS NPRM, the Commission discussed views expressed by two satellite entities to the effect that LMDS should be assigned spectrum in frequencies above 36 GHz (the 40.5-42.5 GHz band was

^{9/} In view of the broader array of services that are available in the 40.5-42.5 GHz band (as opposed to the more limited 27.5-29.5 GHz band), the Commission proposed to use larger licensee service areas than it did for the LMDS. NPRM, FCC 94-273, slip op. at ¶ 24 & n.28.

specifically mentioned). It rejected the proposals as "unsupported," stating that "[u]nlike the 28 GHz band, no LMDS equipment manufacturer has suggested the use of this spectrum for LMDS, nor have we received any petition for rulemaking requesting redesignation of this frequency band by a prospective LMDS provider."^{10/} Now, recognizing the potency of "the demand for licensed services below 40 GHz,"^{11/} and mindful of the fact that the only thing reached during the tenure of the LMDS/FSS 28 GHz Band Negotiated Rulemaking Committee was an impasse, the Commission has obviously reevaluated its earlier stance.

In urging the Commission to close the loop and remove its current LMDS proposal from the 27.5-29.5 GHz band to the 40.5-42.5 GHz band, TRW is doing more than merely serving the laudable goal of preserving scarce spectrum for emerging international satellite services.^{12/} TRW has been and continues to be one of the nation's primary developers of electronics equipment and hardware for the millimeter wave bands. Through its years of experience in this area, TRW has gained a thorough understanding of the properties and inherent strengths of the spectrum above 40 GHz that is proposed for allocation here. It can state with conviction that the technology that would drive LMDS at 28 GHz is not only available for 40 GHz,

^{10/} Second LMDS NPRM, 9 FCC Rcd at 1397 n.15.

^{11/} See NPRM, FCC 94-273, slip op. at ¶ 23.

^{12/} Clearly, demand for the FSS and MSS allocations at 27.5-30.0 GHz and 17.7-20.2 GHz was understated by the Commission when the initial LMDS NPRM was released in 1993, and has escalated sharply since then.

there is no appreciable cost difference. Indeed, it is TRW's view -- a view echoed by the Commission in the NPRM -- that even without considering the obstacles that sharing with satellite providers present, the prospects for terrestrial fiber-optic quality/quantity wideband services are superior at 40 GHz to the prospects at 28 GHz.^{13/}

In TRW's view, the Commission has clearly overcome the reticence that precluded it from ordering, in the Second LMDS NPRM, that further consideration of the 40 GHz band be undertaken. What is unclear is whether the LMDS proponents that expressed reservations about bands other than 28 GHz still hold those objections.^{14/}

Because an LMDS-type service is technologically viable at 40 GHz, and can be established at costs comparable to those experienced at 28 GHz (again without considering the impact of sharing with the satellite services), TRW assumes that the earlier objections of certain LMDS proponents had an economic basis. Following through on that assumption, TRW notes that if the Commission proceeds to establish the LMDS at 28 GHz in CC Docket No. 92-297, and also moves forward in this

^{13/} In fact, TRW believes that spectrum in the vicinity of 60 GHz has the most potential for a service with the attributes claimed for the LMDS. Nevertheless, TRW has no quarrel whatsoever with the Commission's conclusion that the 40.5-42.5 GHz band is well suited to the requirements of the LMDS/LMWS community.

^{14/} See Second LMDS NPRM, 9 FCC Rcd at 1397 n.15 (Commission notes submission of ex parte filing by "Suite 12" entitled, "LMDS Is Not Viable in the 40.5-42.5 GHz Band").

proceeding to establish the LMWS at 40 GHz (and possibly at other of the frequencies noted in the NPRM), there would be a minimum of four new licensees for each relevant service area. Under such conditions, where substantial capital investment is required before even one subscriber can be meaningfully served, the threat to the economic viability of any of the new video delivery services will be profound. The public interest, and the interests of the putative service providers themselves, will be better served if the 28 GHz band service is forsaken and spectrum is concentrated at and above 40 GHz.

CONCLUSION

In this proceeding, the Commission has an opportunity to perform an end run around a problem to which no satisfactory solution has heretofore been presented. By establishing the LMDS service it proposed in CC Docket No. 92-297 at 40.5-42.5 GHz, in lieu of the contentious band segment at 27.5-29.5 GHz, the Commission will be able to give both the new video delivery medium and a broad variety of global satellite services an opportunity to become established in the marketplace. TRW is able to confirm both that cost-comparable equipment exists for LMDS-type services at 40 GHz and that the spectrum is in fact superior to the currently-proposed 28 GHz band segment for this type of service.

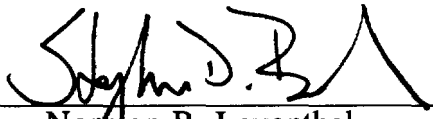
By contrast, if the LMDS is not relocated to the 40 GHz band, the Commission is left with the impasse between satellite and terrestrial interests that was

crystallized during last year's negotiated rulemaking proceeding in CC Docket No. 92-297. The result would likely be some form of band segmentation that would be unsatisfactory to all concerns, and when this is combined with the likely allocation and licensing of LMWS video delivery systems at 40 GHz as a result of this proceeding, the viability of the constrained LMDS systems at 28 GHz will be a doubtful prospect indeed.

In sum, it seems clear to TRW that the Commission has no real choice but to relocate its proposed LMDS service from 28 GHz to 40 GHz. TRW urges the Commission to proceed with its proposed LMWS allocation accordingly.

Respectfully submitted,

TRW Inc.

By: 
Norman P. Leventhal
Raul R. Rodriguez
Stephen D. Baruch

Leventhal, Senter & Lerman
2000 K Street, N.W.
Suite 600
Washington, D.C. 20006

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Its Attorneys